

California and Aquifer Exemptions

Background

The Safe Drinking Water Act (SDWA) directed EPA to establish an Underground Injection Control (UIC) program to prevent endangerment of Underground Sources of Drinking Water (Section 1421(b)(1)). EPA's regulatory approach to aquifer exemptions was promulgated in a 1980 rulemaking. EPA determined that without aquifer exemptions, certain types of energy production, solution mining, or waste disposal would be severely limited. Thus, the regulatory approach that EPA adopted ---- a broad definition of covered underground waters coupled with a discretionary exemption mechanism ---- allows the agency to prevent endangerment consistent with the statute while allowing some case-by-case consideration. This approach protects underground sources of drinking water while also allowing underground injection associated with industrial activities including the production of minerals, oil, or geothermal energy. EPA retains the final approval authority over aquifer exemption decisions regardless of state primacy status.

The vast majority of aquifer exemptions have been granted to UIC Class II oil and gas wells (Table 1), which includes wastewater disposal wells and wells used for the purpose of enhanced recovery (Table 2).

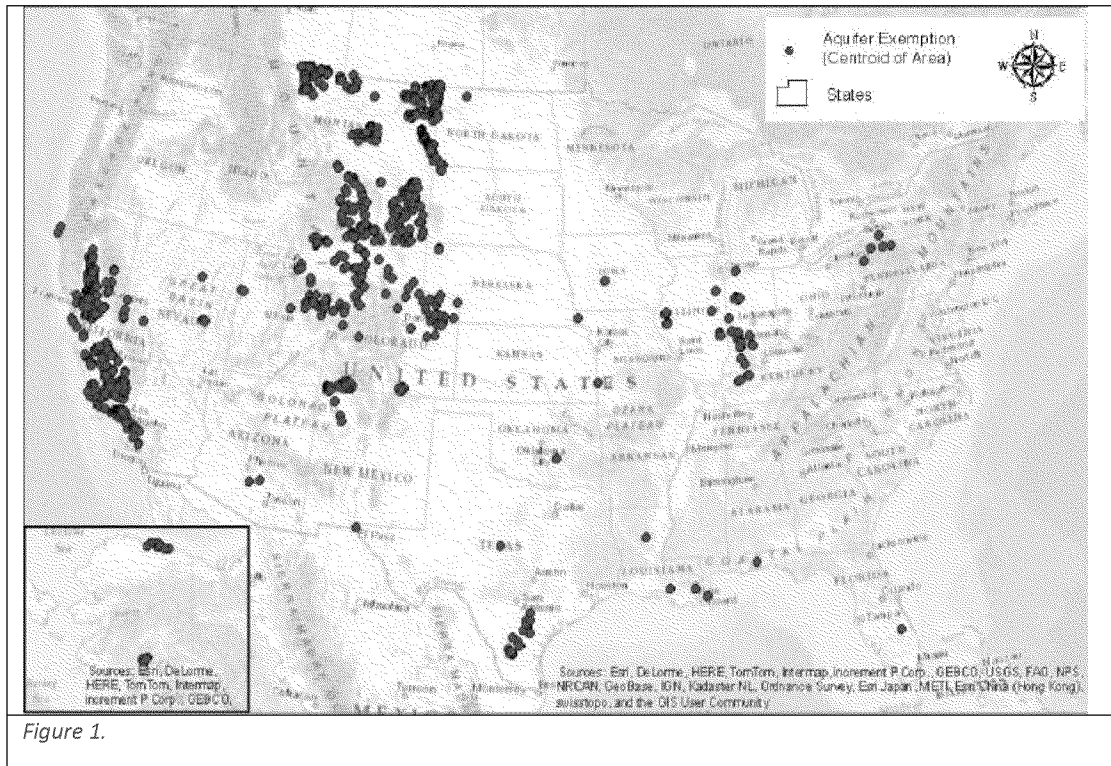
Table 1.

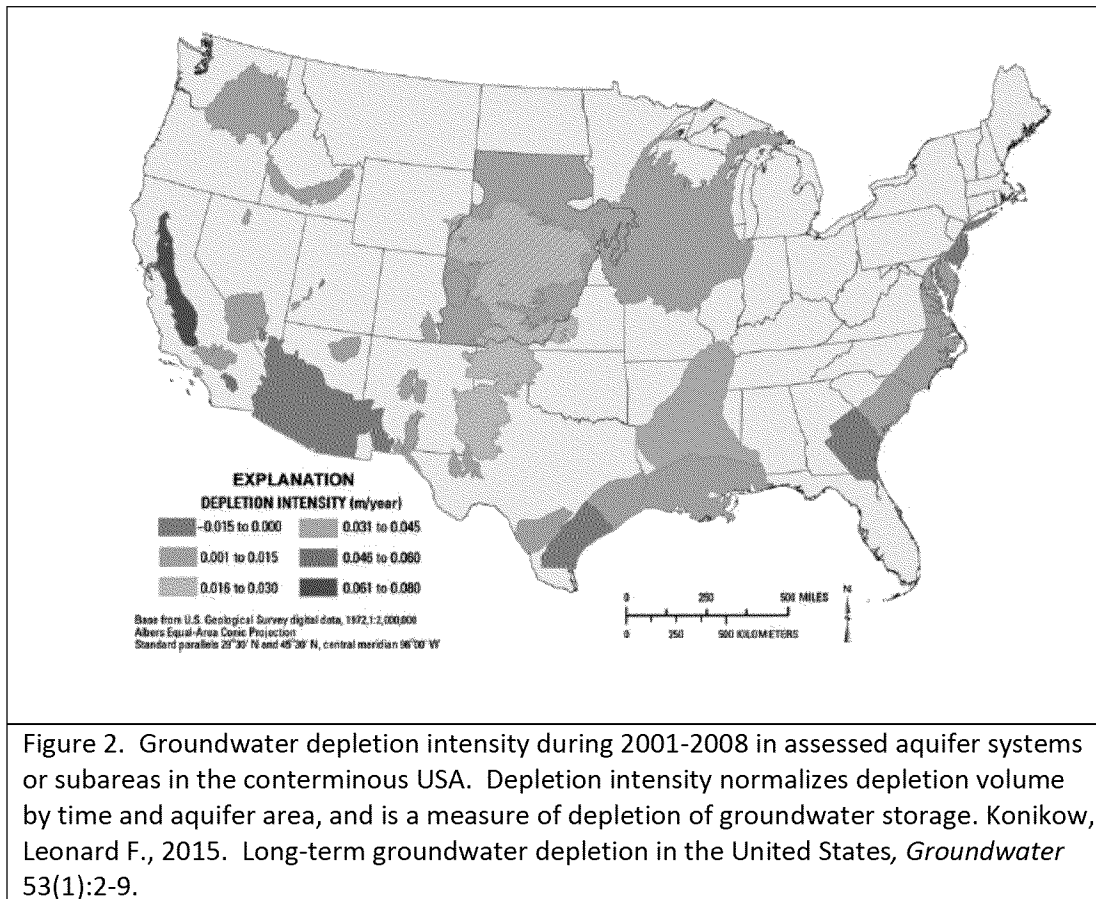
CLASS	Use	Inventory
CLASS I	Inject hazardous wastes, industrial non-hazardous liquids, or municipal wastewater beneath the lowest USDW.	680 wells
CLASS II	Inject brines and other fluids associated with oil and gas production, and hydrocarbons for storage.	172,068 wells
CLASS III	Inject fluids associated with solution mining of minerals beneath the lowest USDW.	22,131 wells
CLASS IV	Inject hazardous or radioactive wastes into or above USDWs. These wells are banned unless authorized under a federal or state ground water remediation project.	33 sites
CLASS V	All injection wells not included in CLASSES I-IV. In general CLASS V wells inject non-hazardous fluids into or above USDWs and are typically shallow, on-site disposal systems. However, there are some deep CLASS V wells that inject below USDWs.	400,000 to 650,000 wells. Note: A range is presented because a complete inventory is not available.
CLASS VI	Inject Carbon Dioxide (CO ₂) for long-term storage, also known as Geologic Sequestration of CO ₂ .	6–10 commercial wells expected to come online by 2016

Table 2

CLASS	Aquifer Exemptions
CLASS I	140
CLASS II	4,614 - II Disposal: 1,251 - II Recovery: 3,037 - II Other: 326
CLASS III	120
CLASS V	2
UNKNOWN	61
TOTAL	4,937

The distribution of aquifer exemptions in the continental USA are shown in Fig.1. A cluster of exemptions are associated with the oil and gas fields in the Central Valley of California, an area of documented groundwater depletion as shown in Fig. 2.





EPA Memorandum and Checklist

The following guidance was contained within the EPA memorandum clarifying the EPA position on aquifer exemption determinations (Peter Grevatt, Director EPA Office of Ground Water and Drinking Water, Memorandum, July 24, 2014).

EPA must follow the regulatory criteria at 40 CFR 146.4 in making aquifer exemption determinations. For the EPA to approve an aquifer exemption, the Agency must first find that the state or, where EPA directly implements the UIC program, the applicant, has demonstrated that the aquifer or the portion of an aquifer identified by the state as exempt "does not currently serve as a source of drinking water" (40 CFR 146.4 (a)). EPA has determined that water that currently serves as a source of drinking water includes water that is being withdrawn in the present moment as well as water that will be withdrawn in the future by wells that are currently in existence. EPA's evaluation of this criterion ensures that water from the exempted area of the aquifer "does not currently serve as a source of drinking water" for nearby drinking water wells as required by 40 CFR 146.4(a).

The second exemption criterion requires EPA to determine either that the aquifer cannot now and will not in the future serve as a source of drinking water or that the total dissolved solids content of the ground water is more than 3,000 and less than 10,000 mg/1 and it is not reasonably expected to supply public water systems. The regulations at 40 CFR 146.4(b) describe four (4) potential reasons for making the determination that the aquifer cannot now and will not in the future serve as a source of drinking water. One reason (146.4(b)(1)) is that the aquifer is mineral, hydrocarbon, or geothermal energy

producing, or can be demonstrated as part of a permit application to contain minerals or hydrocarbons that are expected to be commercially producible. The other reasons relate to practicality of access to water. EPA is continuing discussions with the Ground Water Protection Council (GWPC) workgroup to better define and communicate the type of data and analyses used to support those determinations. EPA Regions will need to document all reasons and factors they considered in a Statement of Basis or decision memo when making the final aquifer exemption decision. As best management practice, EPA will continue to communicate to the states the importance of documenting aquifer exemption analyses and their decision making process.

Checklist

Section B - General Information

- Areal extent of the area proposed for exemption
- Depth and thickness of the aquifer
- Discuss the total dissolved solid (TDS) content of the aquifer, including the TDS at the top and bottom of the exempted zone, and the locations and depths of all fluid samples taken

Section C - Regulatory Criteria

146.4:

(a) Demonstrate that the aquifer or portion thereof does not currently serve as a source of drinking water,

What is the appropriate area to examine for drinking water wells? Although guidance 34 says it should be a minimum of 1/4 mile, the determination of the appropriate area is on a case by case basis. Describe area and give a rationale.

Are there any public or private drinking water wells or springs capturing (or that will be capturing) or producing drinking water from the aquifer or portion thereof within the proposed exemption area?

Evaluate the capture zone of the well(s) in the area near the proposed project (i.e., the volume of the aquifer(s) or portion(s) thereof from within which groundwater is expected to be captured by that well).

A drinking water well's current source of water is the volume (or portion) of an aquifer which contains water that will be produced by a well in its lifetime. What parameters were considered to determine the lifetime of the well?

(d) The areal extent of an aquifer exemption for a Class II enhanced oil recovery or enhanced gas recovery well may be expanded for the exclusive purpose of Class VI injection for geologic sequestration under § 144. I(d) if it does not currently serve as a source of drinking water; and the TDS is more than 3,000 mg/1 and less than 10,000 mg/1; and it is not reasonably expected to supply a public water system.

California Situation

The State of California Department of Conservation Oil and Gas Division, which has primacy for implementing the UIC program for Class II wells, is proposing broad changes in the way it protects underground water sources from oil and gas operations, after finding 2,500 instances in which the state authorized oil and gas operations in protected water aquifers. Apparently there was a

miscommunication between EPA and the state of California over aquifers not exempted as evidenced by inconsistent memorandums of understanding exchanged.

In February 2015 State oil and gas regulators released a plan to the U.S. Environmental Protection Agency for bringing the state back into compliance with federal safe-drinking water requirements.

An ongoing state and federal review has determined the state has repeatedly authorized oil-industry injection into aquifers that were supposed to be protected as current or potential sources of water for drinking and watering crops and livestock.

140 of the 2,553 injection wells are of primary concern to the state, because they were actively injecting oil-field fluids into aquifers with especially designated good water quality.

State water officials currently are reviewing those 140 oil-field wells to see which are near water wells and to assess any contamination of water aquifers from the oil and gas operations.